Name:

at1118paper: Complete the Square (v417)

Example

By completing the square, find both solutions to the given equation:

$$x^2 - 38x = -312$$

Add $\left(\frac{-38}{2}\right)^2$, which equals 361, to both sides of the equation.

$$x^2 - 38x + 361 = 49$$

Factor the left side.

$$(x - 19)^2 = 49$$

Undo the squaring. We need to consider both $\pm\sqrt{49}$.

$$x - 19 = -7 \quad \text{or} \quad x - 19 = 7$$
$$x = 12 \quad \text{or} \quad x = 26$$

Question 1

By completing the square, find both solutions to the given equation:

$$x^2 - 52x = 413$$

Question 2

By completing the square, find both solutions to the given equation:

$$x^2 + 48x = 448$$

Question 3

By completing the square, find both solutions to the given equation:

$$x^2 + 38x \;=\; -192$$

Question 4

By completing the square, find both solutions to the given equation:

$$x^2 - 10x \;=\; 231$$

Question 5

By completing the square, find both solutions to the given equation:

$$x^2 - 18x \;=\; 280$$

Question 6

By completing the square, find both solutions to the given equation:

$$x^2 - 22x \;=\; 104$$